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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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EXAMINER

PRETLOW, DEMETRIUS R

ART UNIT PAPER NUMBER

2863

DATE MAILED: 07/31/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/824,348

Applicant(s)

PASADYN ET AL.

Examiner

Demetrius R. Pretlow

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 02 April 2001.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-23 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1,2,6,7,12,13,17,18 and 23 is/are rejected.
- 7) ☒ Claim(s) 3-5,8-11,14-16 and 19-22 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 02 April 2001 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____
- 4) ☐ Interview Summary (PTO-413) Paper No(s). _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

DETAILED ACTION

Claim Rejections - 35 USC § 102

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

2. Claims 1, 6, 7, 12, 17, 18 and 23 are rejected under 35 U.S.C. 102(e) as being anticipated by Nicholson (US 6,580,960). Nicholson teach processing s plurality of manufactured items in a process flow. Note Nicholson column 2, lines 37-44. Nicholson teach storing a set of production environment data associated with each of the manufactured items. Note Nicholson column 2, lines 56-60. Nicholson teach identifying manufactured items associated with a process drift. Note Nicholson column 6, lines 4-7. Nicholson teach a plurality of characteristic threads based on the production environment data. Nicholson does not explicitly teach the step of generating however this step would be inherent to the process of Nicholson. Note Nicholson column 3, lines 8-35. Nicholson teach a weight value is assigned to each lot in the lot list. Typically, the wafer lots without the failure signature are assigned negative weight values, such as -1, and the wafer lots having the failure signature are assigned positive weight values, which

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suggests comparing the characteristic threads for at least those manufactures items associated with the process drift. Note Nicholson column 4, lines 7-23. Nicholson teach determining at least one potential cause for the process drift based on the comparison of the characteristic threads. Note Nicholson column 4, lines 24-40.

In reference to claims 6 and 17, Nicholson teach processing the plurality of manufactured items in the process flow comprises processing a plurality of semiconductor wafers in a semiconductor device during manufacturing process flow. Note Nicholson column 2, lines 45-47.

In reference to claim 7 and 18 processing the plurality of semiconductor wafers into lots of wafers, an identifying the manufactured associated with the process drift comprises identifying particular lots of wafers associated with the process drift. Note Nicholson column 4, lines 7-24.

In reference to claim 12, Nicholson teach a plurality of tools for processing manufactured items in a process flow. Note Nicholson et al. column 2, lines 56-60. Nicholson teach a database (118) adapted to store a set of production environment data associated with each of the manufactured items. Note Nicholson et al. column 2, lines 56-61. Nicholson teach a drift monitor (100) to identify manufactured items associated with a process drift. Note Nicholson column 6, lines 4-7. Nicholson teach a plurality of characteristic threads based on the production environment data. Nicholson does not explicitly teach generate however that would be inherent to the invention of Nicholson. Note Nicholson column 3, lines 8-35. Nicholson teach a weight value is assigned to

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each lot in the lot list. Typically, the wafer lots without the failure signature are assigned negative weight values, such as -1, and the wafer lots having the failure signature are assigned positive weight values, which suggests comparing the characteristic threads for at least those manufactures items associated with the process drift. Note Nicholson column 4, lines 7-23. Nicholson teach determining at least one potential cause for the process drift based on the comparison of the characteristic threads. Note Nicholson column 4, lines 24-40.

In reference to claim 23, Nicholson teach means for processing a plurality of manufactured items in a process flow. Note Nicholson column 2, lines 45-51. Means for storing a set of production environment data (118) associated with each of the manufactured items. Note Nicholson column 2, lines 56-60. Nicholson teach means for identifying manufactures items associated with the process drift. Note Nicholson claim 6, lines 5-9. Nicholson teach a plurality of characteristic threads based on the production environment data. Nicholson does not explicitly teach generate, however that would be inherent to the invention of Nicholson. Note Nicholson column 3, lines 8-35. Nicholson teach a weight value is assigned to each lot in the lot list. Typically, the wafer lots without the failure signature are assigned negative weight values, such as -1, and the wafer lots having the failure signature are assigned positive weight values, which suggests comparing the characteristic threads for at least those manufactures items associated with the process drift. Note Nicholson column 4, lines 7-23. Nicholson teach means for determining at least one potential cause for the process drift based on the comparison of the characteristic threads. Note Nicholson column 4, lines 24-40.

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claims 2, 13 rejected under 35 U.S.C. 103(a) as being unpatentable over

Nicholson in view of Milor et al. Nicholson teach all of the limitations above.

Nicholson does not teach grouping the characteristic threads into characteristic categories.

Milor et al. teach grouping the characteristic threads into characteristic categories. Note Milor et al. column 2, lines 48-62.

It would have been obvious to a person of ordinary skill in the art at the time the invention was made to modify the invention of Nicholson in view of Milor et al. because it would allow the number of feasible defect causes to be narrowed down. Note Milor et al. column 2, lines 40-44.

Allowable Subject Matter

5. Claims 3-5,9-11,14-16 and 19-22 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.
6. The primary reason for the allowance of claim 3 -5 is the inclusion of the method step of comparing the characteristic threads in a particular characteristic category

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for all the manufactures items to the characteristic threads in the particular characteristic category for the manufactures items associated with the process. It is this step found in each of the claims, as it is claimed in the combination, that has not been found, taught or suggested by the prior art of record which makes these claims allowable over the prior art.

7. The primary reason for the allowance of claims 8 the generating the plurality of characteristic threads comprises based on the production environment data comprises generating characteristic threads for processing tools in the process flow. It is this step found in each of the claims, as it is claimed in the combination, that has not been found, taught or suggested by the prior art of record which makes these claims allowable over the prior art.
8. The primary reason for the allowance of claim 9 is the inclusion of the method step of generating the plurality of characteristic threads comprises based on the production environment data comprises generating characteristic threads for metrology tools used to measure characteristics of semiconductor wafers in the process flow. It is this step found in each of the claims, as it is claimed in the combination, that has not been found, taught or suggested by the prior art of record which makes these claims allowable over the prior art.
9. The primary reason for the allowance of claim 10 is the inclusion of the method step of generating the plurality of characteristic threads comprises based on the production environment data comprises generating characteristic threads based

on incoming characteristics of semiconductor wafers in the process flow. It is this step found in each of the claims, as it is claimed in the combination, that has not been found, taught or suggested by the prior art of record which makes these claims allowable over the prior art.

10. The primary reason for the allowance of claim 11 is the inclusion of the method step of generating the plurality of characteristic threads comprises based on the production environment data comprises generating characteristic threads based on operating recipe parameters used for processing semiconductor wafers in the process flow. It is this step found in each of the claims, as it is claimed in the combination, that has not been found, taught or suggested by the prior art of record which makes these claims allowable over the prior art.

11. The primary reason for the allowance of claim 14-16 is the inclusion of the limitations of an drift monitor is adapted to compare the characteristic threads in a particular characteristic category for all the manufactures items to the characteristic threads in the particular characteristic category for the manufactures items associated with the process. It is these limitations found in each of the claims, as they are claimed in the combination, that has not been found, taught or suggested by the prior art of record which makes these claims allowable over the prior art.

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12. The primary reason for the allowance of claim 19 is the inclusion of the limitations of an drift monitor is adapted to generate characteristic threads for processing tools in the process. It is these limitations found in each of the claims, as they are claimed in the combination, that has not been found, taught or suggested by the prior art of record which makes these claims allowable over the prior art.
13. The primary reason for the allowance of claim 20 is the inclusion of the limitations of an drift monitoris adapted to generate characteristic threads for metrology tools used to measure characteristics of semiconductor wafers in the process flow. It is these limitations found in each of the claims, as they are claimed in the combination, that has not been found, taught or suggested by the prior art of record which makes these claims allowable over the prior art.
14. The primary reason for the allowance of claim 21 is the inclusion of the limitations of an drift monitor is adapted to generate characteristic threads based on incoming characteristics of semiconductor wafers in the process flow. It is these limitations found in each of the claims, as they are claimed in the combination, that has not been found, taught or suggested by the prior art of record which makes these claims allowable over the prior art.
15. The primary reason for the allowance of claim 22 is the inclusion of the limitations of an drift monitor is adapted to generate characteristic threads based on operating recipe parameters used for processing semiconductor wafers in the process flow. It is these limitations found in each of the claims, as they are

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claimed in the combination, that has not been found, taught or suggested by the prior art of record which makes these claims allowable over the prior art.

16. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Demetrius R. Pretlow whose telephone number is (703) 308-6722. The examiner can normally be reached on Monday - Friday from 8:00 am to 4:30 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, John Barlow, can be reached at (703) 308-3126. The fax phone number for the organization where this application or proceeding is assigned is (703) 308-7722.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-1782.

Demetrius R. Pretlow

Demetrius Pretlow

7/18/03

Patent Examiner

John Barlow
John Barlow
Supervisory Patent Examiner
Technology Center 2800